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ABSTRACT

Rural Arizona population estimates were determined for 67 communities by computing a ratio of 1970 population to a 1970 population indicator and then multiplying the resultant persons per indicator times the 1974 value of the specific indicator. The indicators employed were: average daily elementary school enrollment (Arizona Department of Education for the school year 1973-74); postal boxes (U.S. Postal Service, as of July 1973); residential phone connections (Mountain Bell Company, as of March 1974); and electrical hookups (Arizona Public Service Company, as of December 1973). Tables were constructed presenting the results of population estimates for 67 communities for which the Community Development Section compiles community profiles. A range of population was estimated because the data used to indicate population growth was not defined in a consistant explicit manner for each community. Thus, the estimates could not help but contain population in areas immediately surrounding the community. It was felt, however, that a range of population was a more realistic expression of the state of the art of population estimation. (JC)

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MID-1974 POPULATION ESTIMATES FOR NONMETROPOLITAN COMMUNITIES IN ARIZONA

State of Arizona

Office of the Governor

by the

Community Development Section

and

Planning Division

OFFICE OF ECONOMIC PLANNING AND DEVELOPMENT

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August, 1974

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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INTRODUCTION AND SUMMARY

The change in total population of a community is an important indicator of the economic and social development of the community. This change serves as a valuable proxy for analyzing the economic growth of a community. Also, it indicates the effects of migration patterns and may serve to signal areas where future migration could possibly occur. In addition, the level of population can be used as a preliminary benchmark to gauge the market for a specific good or service. The level of population may also serve as an indicator of the probable labor force in a specific community.

Unfortunately, for the most part, there are no comprehensive, consistent population estimates for nonmetropolitan communities in Arizona except those reported in the United States Census. Of course, the difficulty with census estimates is that there is a 10 year time interval between data points. Thus, in a rapidly developing state such as Arizona, it is impossible to use census estimates for any meaningful measure of population.

The Office of Economic Planning and Development (OEPAD) has long recognized this problem and has in the past produced community population estimates. This report represents a continuation and extension of OEPAD's efforts in this area.

Table 1 presents the results of population estimates for 67 Arizona communities for which the Community Development Section compiles community profiles. A range of population was estimated because the data on elementary school enrollments, postal boxes, phone connections, and electrical hookups, which was used to indicate population growth, was not defined in a consistent explicit manner for each community.

Thus, in a sense, the estimates presented in Table 1 can be considered community population estimates for each specific community but in addition the estimates cannot help but contain population in areas immediately surrounding the community. Also, a range of population is a more realistic expression of the state of the art of population estimation. For most communities, our techniques are not so precise that a meaningful point estimate of population could be made; but this did not negate an estimate of a reasonable range of population.

In addition to the population estimates presented in Table 1 the report also serves the valuable function of presenting indicator data for Arizona communities in a single source. (See Tables II through V). The researchers hope that this data will be of use to both private and public analysts.

TABLE I

Community Population Estimates

Community	April, 1970	Mid 1974 Population Range
Apache Junction	4400*	6000-6200
Ajo	5881	6000-6200
Arizona City	625	850-875
Arizona Sunsites	N/A	800-825
Bagdad	2079	2000-2100
Benson	2839	3500-3600
Bisbee	8328	8700-8900
Buckeye	2599	2800-3000
Bullhead City	610	800-850
Camp Verde	N/A	3200-3400
Casa Grande	10536	15500-16000
Cave Creek/Carefree	1285	1900-2100
Chandler	14250	21000-22000
Clarkdale	892	900-950
Clifton/Morenci	8140	10500-10800
Coolidge	6417	7200-7500
Cottonwood	2815	4700-5000
Dolan Springs	N/A	625-675
Douglas	12462	14500-15000
Duncan	733	1000-1200
Eagar	N/A	1700-1900
Eloy	5381	7400-7600
Flagstaff	26117	34000-35000

Table I Continued

Community	April, 1970	Mid 1974 Population Range
Florence	2248	2500-2700
Fredonia	798	900-1000
Gila Bend	1795	2100-2200
Globe	7333	9500-10000
Gilbert	1971	4000-4200
Green Valley	2998	3500-3600
Hayden	1283	1250-1350
Heber/Overgaard	960	1000-1100
Holbrook	4759	4900-5100
Jerome	290	400-425
Joseph City	800	1100-1200
Kearny	2829	3200-3400
Kingman	7312	9500-10000
Lake Havasu City	7000	9000-9500
Mayer	700	750-800
Mammoth/Oracle San Manuel	8522	10000-11000
Miami	3394	3200-3500
Nogales	8946	10500-11000
Page	1439	8500-9000**
Parker	1948	2000-2200
Patagonia	630	650-700
Payson	1490	2800-3000
Picacho/Picacho Peak Red Rock	N/A	400-450

Table I Continued

Community	April, 1970	Mid 1974 Population Range
Pima	1184	1300-1400
Pinetop/Lakeside	2600	~~3100-3200~~ 3500-3700
Prescott	13134	17000-18000
Rio Rico	N/A	750-800
Safford	5333	5800-6000
St. Johns	1320	1400-1500
Sedona/Oak Creek	2022	3900-4100
Show Low	2129	~~2400-2600~~ 3200-3500
Sierra Vista	17324	26000-27000
Snowflake	1977	2300-2500
Springerville	1151	1300-1550
Superior	4975	5200-5400
Taylor	888	1000-1100
Thatcher	2320	2500-2700
Tombstone	1241	1500-1600
Wickenburg	2698	3200-3400
Willcox	2568	2400-2600
Williams	2886	2500-2700
Winkelman	974	900-1000
Winslow	8066	8300-8500
Yuma	29007	33000-34000

* 1971 estimate

** Includes 2600 construction workers and their families.

Source: Community Development Section and Planning Division, Office of Economic Planning and Development, State of Arizona.

PAST STUDIES AND MAJOR DIFFERENCES OF THE PRESENT STUDY

Two past studies by OEPAD have attempted to develop a methodology for community population estimation. The emphasis in both reports was placed upon analysis of multiple regression techniques as a method for community population estimation. Given the heterogeneous nature of Arizona communities and a paucity of sample observations, the statistical quality of the estimates was rather poor.

As a result of this finding, a more simplistic approach was followed which simply involved multiplying the ratio of 1970 population to 1970 electrical hookups times the electrical hookups of a year for which one was attempting to make a population estimate. In using this approach, one must be very careful to isolate only those hookups in a generalized service territory which are associated with a specific community. Also, it is imperative that all hookup data in a community served by multiple electrical suppliers be collected. The present study used the electrical hookups per person approach as one of its component methods of estimating population. But other indicators were used as well for two major reasons. First, after the culmination of OEPAD's earlier study, it became obvious that some communities' population levels had either been significantly over or under stated. Usually, this inaccuracy was traced to inadequate data on electrical hookups; in some cases, hookups in communities with multiple suppliers were missed and in other cases hookups of a general service area were inappropriately identified as being in a community which in fact they were not. Secondly, the scope of the present report was much broader than OEPAD's earlier efforts. The present study reports population estimates for 67 communities for which the Community Development Section compiles community profiles. For many of these communities there were no electrical hookup data available. Due to the data accuracy problems encountered in OEPAD's earlier efforts at community population estimation and the enlarged scope of the present study, the researchers did not feel that the utility hookups per person approach was adequate. Instead, several other indicators of population were used as cross checks for the electrical hookups approach.

METHODOLOGY

The methods used for the population estimates of this report were rather simple. Basically, they involved computing a ratio of 1970 population to a 1970 population indicator and then in turn multiplying the resultant persons per indicator times the 1974 value of the specific indicator. The population indicators used in the study and their data sources are listed below.

- Average Daily Elementary School Enrollment (Arizona Department of Education, for school year 1973-1974, see Table II),
- Postal Boxes (United States Postal Service, as of July 1973, see Table III),
- Residential Phone Connections (Mountain Bell Company, as of March 1974, see Table IV),
- and Electrical Hookups (Arizona Public Service Company, as of December 1973, see Table V).

Attempts were made to collect data for all four of the indicators listed above for each community. However, this proved impossible for a number of the communities because data was not available or was impossible to distinguish from a general service area. For example, postal drop data were not recorded for communities which had city delivery in 1970. Thus, a population to postal drops ratio could not be constructed. The 1970 Postal Service data did record the number of postal boxes, however. Thus, the postal data could be used to estimate the population of the smaller communities only. Also, electrical hookups and phone connections data were not available for many communities.

Another problem encountered in collection of the indicator data was that the geographical areas from which the data were collected was not always homogeneous. Also, the indicator data was not available for exactly the same time periods. (However, this later problem was partially overcome by simply imputing upward the population estimates generated on basis of indicator data from 1973.)

A rather eclectic approach was followed in calculation of the final estimates of population because of the unavailability of some indicator data and the heterogeneous geographical and time frames of the data collected. The following steps were followed in arriving at the final population estimates:

1. Separate population estimates were generated for each community based upon the available indicator data for a specific community.
2. The independent population estimates were manipulated by taking all possible combinations of the estimates and averaging them. The result of steps 1 and 2 was to establish an array of possible population estimates for each community.
3. Next, a community population estimate was generated for each community assuming it grew at the same rate of growth since 1970 as the county in which the community was located. Preliminary 1974 county population estimates

produced by the Department of Economic Security (DES) were used for this purpose. (See Table VI.) The DES based population estimate was then compared to the array of possible population estimates generated through steps 1 and 2.

4. The specification of a reasonable range of population was completed after an evaluation of all the independent estimates in light of special circumstances of some communities such as large temporary construction projects nearby.

5. Finally, the population estimates for all communities within each specific county were compared to DES county population estimates and were found not to be inconsistent.

The result of the above 5 steps was a range of population estimate for the 67 communities listed in Table 1. A range estimate was made because the indicator data utilized in the study was not precisely defined to only encompass the city limits of a specific city. Thus, the population estimates of Table 1 cannot help but include some population of areas immediately surrounding any specific community. Also, the range approach is a more honest presentation of the state of the art of population estimation. Rarely are backup data so precisely defined that a realistic point estimate of population can be developed for most communities. For these reasons, the population range approach was thought to be the most reasonable.

TABLE II

Nonmetropolitan Community Average Daily Elementary School Enrollment

Community	1969-1970	1973-1974
Apache Junction	539	918
Ajo	1110	1096
Arizona City	163	214
Bagdad	453	405
Benson	545	600
Bisbee	1546	1271
Buckeye	892	836
Bullhead City	469	659
Camp Verde	374	448
Casa Grande	2322	2732
Cave Creek/Carefree	281	458
Chandler	3018	3711
Clarkdale	186	195
Clifton/Morenci	1411	1174
Coolidge	1685	1801
Cottonwood	734	1180
Dolan Springs	67	85
Douglas	3049	2812
Duncan	358	503
Eloy	1431	1412
Flagstaff	4673	4796
Florence	663	675
Fredonia	167	221

Table II Continued

Community	1969-1970	1973-1974
Gila Bend	478	486
Globe	1410	1589
Gilbert	781	1267
Green Valley	473	740
Hayden	522	514
Heber/Overgaard	178	168
Holbrook	1201	1163
Jerome	185	195
Joseph City	192	176
Kearny	996	1023
Kingman	991	1951
Lake Havasu City	800	1361
Miami	1465	1462
Mayer	122	135
Mammoth/Oracle San Manuel	1859	2026
Nogales	2518	2768
Page	866	1648
Parker	1013	1137
Patagonia	93	77
Payson	367	498
Picacho/Picacho Peak Red Rock	261	212
Pinetop/Lakeside	520	639

Table II Continued

Community	1969-1970	1973-1974
Prescott	2408	2458
Pima	326	334
St. Johns	337	307
Sedona/Oak Creek	2408	2458
Show Low	498	583
Sierra Vista	1770	2455
Safford	1418	1450
Snowflake	828	978
Springerville/Eagar	N/A	685
Superior	1060	968
Taylor	828	978
Thatcher	545	642
Tombstone	477	626
Wickenburg	365	394
Willcox	988	886
Williams	534	481
Winkleman	996	1023
Winslow	1527	1383
Yuma	5991	5662

* Average daily attendance in school districts overlaping given community.

Source: Community Development Section and Planning Division Office of Economic Planning and Development, State of Arizona.

TABLE III

Nonmetropolitan Community Postal Boxes

Community	1970	1973
Apache Junction	3267	7775
Baqdad	586	597
Benson	1113	1356
Bullhead City	2145	2785
Camp Verde	741	896
Cave Creek/Carefree	777	1045
Clarkdale	351	392
Clifton/Morenci	2653	2638
Cottonwood	1099	1444
Fredonia	228	300
Gila Bend	620	720
Hayden	507	510
Heber/Overgaard	250	266
Jerome	163	220
Joseph City	134	151
Kearny	1028	1085
Lake Havasu City	1938	2785
Mayer	304	414
Page	590	2150
Patagonia	327	405
Payson	1028	1346
Picacho/Picacho Peak Red Rock	229	232

Table III Continued

Community	1970	1973
Pima	417	493
Pinetop/Lakeside	1122	1579
St. Johns	462	561
Sedona/Oak Creek	1594	2206
Show Low	928	1445
Snowflake	688	743
Springerville	564	570
Taylor	211	295
Thatcher	878	840
Tombstone	585	660

* Postal boxes were reported more fully in 1973 than in 1970; thus, for many of the communities, there are no complete data.

Source: Community Development Section and Planning Division, Office of Economic Planning and Development, State of Arizona.

TABLE IV

Nonmetropolitan Community Residential Phone Connections

Community	1970	1974
Benson	830	1208
Bisbee	2689	2890
Camp Verde	572	1151
Casa Grande	2449*	3713*
Clifton/Morenci	1992**	2649**
Coolidge	1524	1975
Cottonwood	1206	2114
Douglas	3188	3894
Duncan	221	512
Eloy	937	1370
Flagstaff	5435	7204
Florence	538	697
Gila Bend	320	382
Globe	3226	4122
Joseph City	101	179
Mayer	N/A	N/A
Mammoth/Oracle San Manuel	1463	2270
Page	335	1708
Payson	424	1247
Pima	254	367
Prescott	4957	7126
Sedona/Oak Creek	984	1846

Table IV Continued

Community	1970	1974
Sierra Vista	3123	7517
Superior	949	1130
Wickenburg	998	1368
Williams	526	628
Winslow	1969	2205
Yuma	9600	12613

* Casa Grande only, does not include Stanfield.

** Phone connections for Clifton only.

Source: Community Development Section and Planning Division, Office of Economic Planning and Development, State of Arizona.

TABLE V

Nonmetropolitan Community Electric Hook-Ups

Community	1970	1973
Bisbee	2702	3344***
Casa Grande	2669	3675
Clarkdale	540	420****
Coolidge	1466	1911
Cottonwood	1130	2085**
Douglas	3589	4675
Eloy	1151	1935
Flagstaff	6431	10095
Florence	615	790
Gila Bend	490	856
Globe	2060	3230
Holbrook	1272	1435
Kearny	647	801
Miami	958***	3530***
Page	656	1690
Prescott	5010	9741
Safford	1746	1892***
Show Low	563	993
Snowflake	452	623
Superior	1440	1490
Williams	707	1154
Winslow	2732	2789

Page I

** Includes Clemenceau
*** Includes Tintown and Don Luis
**** Includes Centerville

Page III

*** May 1974
*** These must define different service areas

Source: Community Development Section and Planning Division, Office of Economic Planning and Development, State of Arizona.

TABLE VI

Preliminary 1974 Population
Estimates For Counties
In Arizona

County	July 1, 1974 Population Estimate
Apache	40,600
Cochise	75,400
Coconino	62,700
Gila	32,000
Graham	18,000
Greenlee	11,600
Maricopa	1,173,000
Mohave	34,300
Navajo	53,800
Pima	435,000
Pinal	80,500
Santa Cruz	17,400
Yavapai	47,400
Yuma	68,300

Source: Department of Economic Security

Footnotes

1) Judith Storms, Summary Report on Small Community Analysis, Arizona Office of Economic Planning and Development, August, 1972. Also see Judith Storms, Population Estimates for Rural Communities, Arizona Office of Economic Planning and Development, May, 1973.